

# **Charter Boat Catch and Effort from the Michigan Waters of the Great Lakes, 2002**

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## **Introduction**

Michigan's charter boat industry increased from 250 operations in 1979 to nearly 900 in 1989. Since the late 1980s, the number of charter boats used for sport fishing excursions on Michigan's Great Lakes waters has declined to approximately 500. The charter fishing industry provides Michigan with significant economic benefits. For example, 239,000 clients spent an estimated \$21 million in addition to charter fees in 1985, and the total statewide investment by charter boat firms in the same year was estimated to exceed \$30 million.

Reporting of sport catch and effort by the charter fishing industry is required under Public Act 451 (Part 445) of 1994. Similar legislation was first enacted during 1989 (Act 22, Public Acts of 1989), and was supported by both the Michigan Charter Boat Association (MCBA), an industry representative, and Michigan Department of Natural Resources (MDNR). Among other provisions, the law includes stringent penalties for charter fishing operators who are delinquent by more than 60 days with their catch reports. Also, the law requires that all operators maintain on board an up to date daily log of their catch and fishing activity.

The objective of the catch reporting system is to obtain a continuous annual record of fishing effort and the number, type, and location of fish harvested by charter boat anglers in Michigan. These data have assisted MDNR's Great Lakes fishery management efforts by providing valuable trend information about charter harvest and catch rates, which reflect the status of fish stocks important to the industry. The data also allows MCBA to monitor the health and welfare of its industry.

## **Methods**

The Michigan Charter Boat Daily Catch Report form was developed in 1989 by a committee made up of two members each from MDNR and MCBA. Forms and grid maps of the Great Lakes were mailed to all known charter operators during March 2002. Charter operators were identified from previous years' lists of

reporting operators and from Sport Trolling Licenses obtained from MDNR's Law Enforcement Division. Charter operators who used their vessels for fishing were informed that they are required by law to complete the form each time they fished. A form is to be mailed by the tenth of each month following the month of fishing to MDNR's Charlevoix Fisheries Research Station.

The data form requires the following information: an assigned identification number for each charter boat, lake, date fished, port, grid, hours fished, number of resident and nonresident anglers, catch (number) of major species, and number of sea lamprey seen attached to chinook salmon or lake trout. Space is also provided on the form for comments or observations.

Completed data forms returned to Charlevoix Fisheries Research Station were logged, coded by port fished, and entered into the program database. Incomplete forms were logged and returned to the charter operator with a letter explaining why the report was returned.

The majority of charter fishermen operate during April through October. Each month (June through October), postcard notices were sent to charter operators who had not filed a report for the previous month. Two notices were sent each month, the first after an operator was delinquent for 10 days and the second after 30 days.

In January 2003, operators who had not filed reports for two or more months during the period May through September were sent letters via certified mail. These letters informed the operator that this would be the last notice he or she would receive. If the recipient did not respond in writing within 10 days of receipt of this notice, his or her name could be submitted to MDNR's Law Enforcement Division, recommending non-issuance of an inspection certificate for the 2003 season.

Three measures of fishing effort were summarized: angler hours, angler trips, and charter excursions. Angler hours were based upon total hours fished (dock to dock) by each angler. An angler trip was one completed fishing outing by one individual. A charter excursion

was one completed boat trip. For example, if a charter operator took four anglers fishing for six hours, total fishing effort would be 24 angler hours, four angler trips, and one charter excursion.

Data regarding number of sea lamprey observed by charter operators were collected at request of the U.S. Fish and Wildlife Service's (USFWS) Sea Lamprey Control Station at Marquette, Michigan. These data are used by USFWS as an index of sea lamprey abundance.

## Results

### *Compliance*

During the 2002 fishing season, an average of 62% of all charter boat operators complied with the law by submitting their catch reports on time, while 77% submitted reports within 30 days of the due date. Monthly rate of compliance in 2002 was slightly less than in 2001. By the end of 2002, 93% of all charter operators had complied with the law, which was four percent less than in 2001.

### *Fishing effort*

Charter operators submitted reports on 17,437 charter excursions during April through October, 2002 on Lakes Michigan, Huron, Erie, Superior and St. Clair (Tables 1 through 5). The St. Clair data include Lake St. Clair, the St. Clair River and the Detroit River systems. The total number of charter excursions in 2002 increased slightly (+3%) compared to 2001 (Table 6). Most of this increase occurred on Lake Michigan; the number of excursions on Lakes Erie, Superior, and St. Clair decreased slightly, compared to 2001. The St. Clair system had the largest change (-18%) in the number of charter excursions compared to 2001. The distribution of charter fishing excursions in 2002 by lake was: 68% Lake Michigan, 17% Lake Huron, 11% Lake Erie, 2% Lake Superior, and 2% Lake St. Clair. This distribution was very similar to previous years.

A total of 448,124 hours were spent fishing by 75,716 charter anglers in Michigan's waters and tributaries of the Great Lakes (Tables 1 through 5). The total number of charter anglers

in 2002 did not change significantly, compared to 2001. Twenty-five percent of all charter clients were not residents of Michigan. Lake Superior charter operators had the greatest percentage of nonresident clients (46%; Table 4), while Lake Huron charter captains had the lowest percentage (12%; Table 2).

### *Catch*

A total of about 230,000 fish were reported harvested in all lakes (Tables 1 through 5). Lake Michigan accounted for 45% of all fish harvested, while lakes Erie and Huron accounted for 37% and 10%, respectively. The most numerous species in the harvest was yellow perch (68,544), which accounted for 30% of the total harvest. Numbers of other species harvested were: 61,723 chinook salmon (27%), 40,392 walleye (18%), 22,498 lake trout (10%), 17,321 coho salmon (8%), 11,707 rainbow trout (5%), and 2,565 brown trout (1%). The "other" species category accounted for the remainder of the catch. Since other species are not identified on the catch reporting form, the actual composition of this category is unknown.

The overall numbers of salmonines harvested from Michigan's Great Lakes waters increased by over 18,000 fish (+19%) from 2001 to 2002. The harvest of coho salmon (+54%), chinook salmon (+43%), and brown trout (+31%) increased as compared to the previous year, while the number of rainbow trout (-19%) and lake trout (-16%) harvested decreased. Increased harvest of coho salmon, chinook salmon and brown trout occurred in both Lakes Michigan and Huron, but the decline in lake trout harvest occurred only in Lake Michigan (-4,323 fish or -29%). In Lake Huron, lake trout harvest increased (+629 fish or +9%) from 2001 to 2002.

On the Michigan waters of the Great Lakes, the number of walleye harvested decreased 20%, while the number of yellow perch harvested in 2002 increased 40% compared to 2001. The majority of walleye harvested by charter anglers in the Michigan waters of the Great Lakes come from Lake Erie, and the Lake Erie walleye harvest decreased 18% in 2002 compared to 2001, whereas walleye harvest from the St. Clair

system declined by 53%. Seventy percent of the total yellow perch harvest during 2002 came from Lake Erie, while 15% came from Lake Michigan and 14% came from the St. Clair system. The harvest of yellow perch increased in Lake Erie (+62%) and the St. Clair system (+55%), but decreased (-8%) in Lake Michigan during 2002, as compared to the previous year.

#### *Catch rates*

Most charter excursions that took place on Michigan's Great Lakes waters during 2002 were aimed at the various species of salmonines. Catch rates (fish per 100 angler hours) by Lake Michigan charter anglers increased in 2002 as compared to 2001 for coho salmon (+43%), chinook salmon (+39%), and brown trout (+17%), whereas rates for rainbow trout (-23%) and lake trout (-31%) decreased (Table 7). The catch rate reported in 2002 for chinook salmon on Lake Michigan was the greatest recorded in the 13 year (1990-2002) data series.

On Lake Huron, catch rates for coho salmon (+320%), chinook salmon (+48%), brown trout (+100%), and lake trout (+14%) all increased in 2002 compared to 2001, while the rates for rainbow trout declined (-6%) as compared to 2001. The catch rate reported in 2002 for coho salmon on Lake Huron (2.1 fish per 100 angler hours) was the greatest recorded in the 1990-2002 data series.

Lake trout are the most important salmonine in the charter catch from Lake Superior. Catch rates for lake trout on Lake Superior during 2002 declined slightly (-8%), as compared with 2001. Other salmonine species (such as coho and chinook salmon) do not occur in significant numbers in the Lake Superior charter catch.

Walleye and yellow perch typically play an important role in charter fisheries on Lakes Erie, Huron, and St. Clair. Catch rates for walleye by charter anglers declined on Lake Huron (-23%), on the St. Clair system (-43%), and on Lake Erie (-14%) during 2002, as compared to 2001 (Table 8). Catch rates for yellow perch on Lake Erie and on the St. Clair system increased significantly during 2002, as compared to 2001. Lake Erie catch rate increased by 70% (58 to 98 fish per 100 angler hours), whereas St. Clair

catch rate increased by 88% (55 to 104 fish per 100 angler hours). Yellow perch were a minor component of the Lake Huron charter fishery in 2002.

Many charter captains consider the mixed bag catch rate of the five species of salmon and trout as their measure of a successful charter excursion. The total catch per charter excursion for all five species of salmonines combined in 2002 increased at the Lake Michigan ports of St. Joseph/Benton Harbor, Ludington, Manistee, Frankfort / Elberta, and Leland, whereas mixed bag catch rate at Grand Haven remained unchanged (Table 9). Mixed bag catch rate increased at all five selected Lake Huron ports in 2002, with the largest increase (+41%) occurring at Oscoda (Table 9). On Lake Superior, salmonine catch rates increased at Marquette (+27%), but declined slightly at Black River Harbor (-7%) and Ontonagon (-6%; Table 9).

Numbers of sea lamprey attached to chinook salmon and lake trout have generally been higher on Lake Huron than on the other Great Lakes (Table 10). However, numbers of sea lamprey attached per 100 lake trout harvested from Lake Huron in 2002 were 1.5, as compared to 2.2 for Lake Michigan and 0.4 for Lake Superior. Charter captains also reported 4.2 lamprey per 100 chinook salmon harvested on Lake Huron during 2002 as compared to 0.8 for Lake Michigan and 0.0 for Lake Superior. In 2002, sea lamprey incidence on Lake Michigan was the highest yet recorded for both chinook salmon and lake trout.

#### **Acknowledgments**

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Table 1.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Lake Michigan, 2002.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.050	1.316	1,017	2,278	2,462	1,267	5,649	2,984	32	15,689
Chinook salmon	0.161	4.244	141	5,498	4,656	11,280	21,564	7,319	147	50,605
Rainbow trout	0.034	0.893	265	505	2,331	4,738	2,170	362	277	10,648
Brown trout	0.007	0.194	929	606	126	285	308	52	2	2,308
Lake trout	0.034	0.885	23	1,330	2,712	3,363	2,978	141	0	10,547
Yellow perch	0.033	0.862	261	595	2,388	2,609	3,071	1,313	46	10,283
Walleye	0.005	0.139	3	190	368	235	316	227	320	1,659
Other	0.002	0.059	13	445	28	109	45	51	11	702
Lamprey on:										
Chinook salmon			0	59	69	104	149	22	2	405
Lake trout			0	21	69	64	73	1	0	228
Angler hours			7,624	29,831	46,130	78,644	109,552	36,939	4,812	313,531
Angler trips			1,223	4,912	7,447	13,079	18,223	6,456	698	52,038
Anglers										
Resident			821	3,301	5,211	9,315	13,217	4,733	297	36,895
Nonresident			402	1,611	2,239	3,764	5,006	1,723	401	15,146
Charter excursions			251	1,067	1,632	2,926	4,263	1,569	216	11,924

Table 2.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Lake Huron, 2002.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.021	0.450	16	173	309	378	333	75	10	1,294
Chinook salmon	0.182	3.848	34	784	1,133	3,256	4,753	1,059	41	11,060
Rainbow trout	0.016	0.342	73	64	197	367	224	49	8	982
Brown trout	0.004	0.088	15	9	33	93	86	16	0	252
Lake trout	0.127	2.686	5	686	2,622	1,957	2,285	166	0	7,721
Yellow perch	0.009	0.181	0	0	2	111	61	345	0	519
Walleye	0.023	0.477	0	37	240	800	291	3	0	1,371
Other	0.011	0.233	0	9	277	315	46	22	0	669
Lamprey on:										
Chinook salmon			1	33	83	182	149	19	0	467
Lake trout			0	15	45	26	26	1	0	113
Angler hours			965	5,000	10,658	18,727	20,076	5,232	216	60,873
Angler trips			141	889	1,863	3,284	3,543	969	42	10,731
Anglers										
Resident			131	844	1,702	2,803	3,116	810	35	9,441
Nonresident			10	45	161	483	427	159	7	1,292
Charter excursions			53	227	501	872	950	255	16	2,874

Table 3.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Lake Erie, 2002.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.000	0.001	0	0	1	0	0	0	0	1
Chinook salmon	0.000	0.000	0	0	0	0	0	0	0	0
Rainbow trout	0.001	0.020	2	4	7	4	20	0	0	37
Brown trout	0.000	0.000	0	0	0	0	0	0	0	0
Lake trout	0.000	0.000	0	0	0	0	0	0	0	0
Yellow perch	0.979	25.825	1	187	1,432	726	16,346	24,086	5,076	47,854
Walleye	0.740	19.512	187	3,424	21,415	9,903	480	746	0	36,155
Other	0.024	0.625	1	334	538	179	37	28	42	1,159
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0
Angler hours			351	5,983	22,840	11,291	3,392	4,304	713	48,873
Angler trips			46	1,046	4,410	2,128	649	864	151	9,294
Anglers										
Resident			24	939	3,913	1,826	560	717	130	8,109
Nonresident			22	107	497	302	89	147	21	1,185
Charter excursions			16	229	857	422	131	169	29	1,853

Table 4.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Lake Superior, 2002.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.022	0.784	0	25	180	79	31	21	1	337
Chinook salmon	0.004	0.135	0	13	11	11	16	7	0	58
Rainbow trout	0.003	0.093	0	3	19	3	14	0	1	40
Brown trout	0.000	0.012	0	0	2	2	0	1	0	5
Lake trout	0.276	9.837	0	126	974	1,427	1,279	420	4	4,230
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.000	0	0	0	0	0	0	0	0
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	7	6	6	0	0	19
Angler hours			0	453	3,917	5,110	4,432	1,394	15	15,320
Angler trips			0	67	507	680	637	210	3	2,104
Anglers										
Resident			0	38	264	341	351	131	2	1,127
Nonresident			0	29	243	339	286	79	1	977
Charter excursions			0	17	92	141	131	47	2	430

Table 5.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on the St. Clair system (Lake St. Clair, St. Clair River, and the Detroit River), 2002.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.000	0.000	0	0	0	0	0	0	0	0
Chinook salmon	0.000	0.000	0	0	0	0	0	0	0	0
Rainbow trout	0.000	0.000	0	0	0	0	0	0	0	0
Brown trout	0.000	0.000	0	0	0	0	0	0	0	0
Lake trout	0.000	0.000	0	0	0	0	0	0	0	0
Yellow perch	1.038	27.775	0	26	836	1,870	1,923	3,250	1,983	9,888
Walleye	0.127	3.390	275	135	185	195	401	16	0	1,207
Other	0.277	7.404	1	41	460	997	780	309	48	2,636
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0
Angler hours			540	366	1,426	2,275	2,383	1,711	826	9,527
Angler trips			90	75	237	360	370	263	136	1,531
Anglers										
Resident			54	30	186	281	286	250	125	1,212
Nonresident			36	47	51	79	90	18	11	332
Charter excursions			26	17	52	81	89	59	32	356

Table 6.—Number of charter excursions on the Michigan waters of the Great Lakes, 1990-2002.

Lake	Year												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Michigan	13,467	13,604	10,995	10,298	10,116	9,996	10,344	10,627	12,333	11,382	11,714	11,224	11,924
Huron	4,010	3,442	2,521	2,307	2,182	2,599	2,592	2,684	3,210	3,123	2,760	2,867	2,874
Erie	1,684	1,445	1,679	1,881	1,661	1,781	1,775	1,727	1,679	2,380	1,836	1,947	1,853
Superior	755	791	743	618	455	515	524	497	517	607	482	477	430
St. Clair	779	643	509	414	299	336	407	394	432	389	348	433	356
Total	20,695	19,925	16,447	15,518	14,713	15,227	15,642	15,929	18,171	17,881	17,140	16,948	17,437

Table 7.—Catch rates (fish per 100 angler hours) by charter anglers for salmonines on Lakes Michigan, Huron and Superior during 1990-2002.

Species	Year												
	90	91	92	93	94	95	96	97	98	99	00	01	02
<b>Michigan</b>													
Coho salmon	3.9	2.8	3.4	4.5	2.6	2.2	2.9	3.8	4.8	3.4	5.7	3.5	5.0
Chinook salmon	7.4	7.0	4.9	4.0	4.0	5.0	9.0	9.6	8.1	8.9	12.4	11.6	16.1
Rainbow trout	4.0	7.2	6.5	5.0	5.2	3.0	6.3	4.8	4.0	3.4	3.0	4.4	3.4
Brown trout	0.6	0.8	0.4	0.7	1.1	0.7	1.1	1.5	0.6	0.7	1.3	0.6	0.7
Lake trout	8.4	8.7	7.6	9.7	10.4	10.2	7.5	7.2	9.4	6.2	6.0	4.9	3.4
<b>Huron</b>													
Coho salmon	0.2	0.2	0.2	0.3	0.3	0.1	0.4	0.2	0.4	0.9	0.6	0.5	2.1
Chinook salmon	6.0	6.4	6.4	7.2	8.3	11.7	11.8	18.5	16.1	15.7	12.1	12.3	18.2
Rainbow trout	0.3	0.6	0.7	1.4	1.3	2.6	2.6	2.0	1.3	1.3	1.3	1.7	1.6
Brown trout	0.1	0.2	0.7	1.7	2.1	1.9	0.8	0.4	0.6	0.2	0.2	0.2	0.4
Lake trout	9.8	7.9	6.6	4.3	6.3	6.6	9.4	9.8	12.6	11.7	12.8	11.1	12.7
<b>Superior</b>													
Coho salmon	1.2	3.2	1.3	1.0	1.6	1.7	1.9	1.1	0.7	2.3	0.8	1.7	2.2
Chinook salmon	0.3	0.4	0.3	0.3	0.1	0.2	0.3	0.1	0.7	0.6	0.5	0.6	0.4
Rainbow trout	0.3	0.3	0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.1	0.3	0.3
Brown trout	0.1	0.2	0.1	0.0	0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.1	<0.1
Lake trout	28.5	27.9	25.5	28.2	25.3	26.2	28.5	26.9	25.2	26.3	27.2	30.1	27.6

Table 8.—Catch rates (fish per 100 angler hours) by charter anglers for yellow perch and walleye on Lakes Huron, St. Clair and Erie during 1990-2002.

Species	Year												
	90	91	92	93	94	95	96	97	98	99	00	01	02
<b>Huron</b>													
Yellow perch	9.2	7.4	6.3	4.0	4.9	3.7	2.8	1.6	2.5	8.4	3.9	2.8	0.9
Walleye	5.1	7.1	6.7	7.4	6.7	3.5	3.4	3.0	3.7	3.4	4.2	3.0	2.3
<b>St. Clair</b>													
Yellow perch	13.8	16.8	15.1	40.4	85.5	66.9	100.3	103.3	42.9	41.3	48.3	55.1	103.8
Walleye	32.4	20.4	12.5	18.4	12.3	15.5	12.3	13.1	16.1	16.3	7.2	22.2	12.7
<b>Erie</b>													
Yellow perch	29.4	34.1	43.3	43.9	28.7	51.7	78.4	74.6	70.4	67.2	53.5	57.7	97.9
Walleye	74.5	62.8	78.5	81.4	69.6	82.4	82.2	83.9	106.7	80.0	82.9	85.9	74.0

Table 9--Total catch per excursion (number of fish, for all salmonines combined) by charter anglers at various ports on lakes Michigan, Huron and Superior 1990-2002.

Port	Year												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
<b>Lake Michigan</b>													
St. Joseph/Benton Harbor	7.3	8.7	7.3	8.1	7.7	7.7	10.0	9.8	9.3	7.0	10.3	7.4	8.9
Grand Haven	5.0	5.5	4.7	5.3	5.0	5.2	6.1	6.7	6.7	5.3	7.8	6.6	6.5
Ludington	9.3	11.1	8.4	8.8	7.4	7.2	10.8	8.4	8.1	8.8	9.1	9.0	9.3
Manistee	6.2	8.0	5.7	6.2	5.8	6.9	10.3	8.8	8.2	7.5	9.6	6.8	9.2
Frankfort/Elberta	7.1	7.5	5.8	6.6	6.2	6.7	8.8	7.6	8.2	8.1	7.6	7.3	7.7
Leland	7.2	9.5	9.0	6.9	9.1	8.6	9.4	9.1	8.1	7.1	6.9	6.2	7.1
<b>Lake Huron</b>													
Rogers City	3.2	3.3	2.5	3.9	5.2	6.6	5.9	8.2	5.4	6.3	4.1	3.9	4.1
Alpena	3.4	3.5	4.7	4.9	4.7	5.1	5.2	6.4	6.6	7.2	6.8	6.2	8.1
Oscoda	4.0	4.0	3.6	3.0	3.2	5.2	6.2	7.1	7.1	7.0	5.8	4.6	6.5
Grindstone City	5.6	6.1	5.9	4.7	5.5	7.0	8.0	9.3	10.7	10.1	10.6	9.4	12.3
Harbor Beach	3.6	2.9	3.2	2.8	3.5	4.9	6.6	6.5	6.7	7.1	5.9	6.5	7.2
<b>Lake Superior</b>													
Marquette	10.9	10.9	11.4	10.9	8.3	11.2	13.0	11.9	7.0	10.4	11.5	8.9	11.3
Ontonagon	12.5	11.5	14.1	14.0	10.1	11.1	15.9	11.9	13.7	14.8	13.2	14.5	13.7
Black River Harbor	12.0	12.9	10.6	13.5	14.1	12.6	14.0	13.1	10.7	13.6	12.3	15.9	14.8

Table 10.—Sea lamprey incidence (lamprey per 100 fish) for chinook salmon and lake trout harvested by the charter fishery in the Michigan waters of the Great Lakes, 1990-2002.

Species/Year	Lake		
	Michigan	Huron	Superior
<b>Chinook salmon</b>			
1990	0.5	18.6	0.0
1991	0.3	13.9	8.0
1992	0.2	13.6	0.0
1993	0.1	7.6	0.0
1994	0.3	7.1	0.0
1995	0.3	6.2	3.0
1996	0.1	3.9	0.0
1997	0.2	4.7	0.0
1998	0.4	5.2	0.0
1999	0.2	4.6	0.0
2000	0.4	7.3	1.1
2001	0.5	4.6	0.0
2002	0.8	4.2	0.0
<b>Lake trout</b>			
1990	1.8	6.6	1.8
1991	1.2	5.7	1.6
1992	0.8	4.6	0.8
1993	0.6	2.1	0.5
1994	0.6	3.3	1.1
1995	1.0	2.7	0.7
1996	0.7	1.9	1.0
1997	1.1	3.0	0.6
1998	1.1	2.1	0.5
1999	1.2	1.8	0.5
2000	1.3	2.2	0.4
2001	1.3	2.0	0.7
2002	2.2	1.5	0.4